

LV.—On a *Monstrosity of Gentiana campestris*. By G. DICKIE, M.D., Lecturer on Botany in the University and King's College of Aberdeen*.

IN August 1844 there occurred in the vicinity of Aberdeen several remarkable monstrosities of *Gentiana campestris* which appear worthy to be recorded. The plants were growing near the sea in a soil of almost pure sand. In many of them all the flowers were fully double; in other cases the monstrous flowers, the structure and arrangement of which are now to be described, were growing on the same plant with those alluded to, but were as frequently associated with others presenting the usual structure.

The monstrous flowers may be briefly described as consisting of a calyx, presenting the number and arrangement of parts commonly found in *Gentiana campestris*; the corolla was mostly natural, but sometimes 5-cleft; stamens four, sometimes more, in most cases either partially or wholly petaloid, these three whorls presenting the usual relation to each other. The greatest deviation from the natural structure occurred in the central whorl. Instead of a pistil there were frequently flower-buds, in one case no fewer than eight, in another six, five of these forming a regular whorl round a central bud; and sometimes ovaries nearly natural were intermixed with flower-buds.

The accompanying Table will show at a glance the general arrangement in ten of these flowers.

No.	<i>Calyx.</i>	<i>Corolla.</i>	<i>Stamens.</i>	<i>Pistil.</i>
1.	Of usual structure.	4-cleft, irregular.	4, petaloid.	7 flower-buds.
2.	Irregular.	5 pieces, each 2-cleft.	5, petaloid.	Pedunculated flower-buds and ovaries.
3.	Of usual structure.	2 corollæ, each 4-cleft.	4 in each corolla, partially petaloid.	In each 1 ovary.
4.	Of usual structure.	4-cleft.	4, natural.	1 perfect ovary.
5.	Of usual structure.	4-cleft.	4, petaloid.	1 flower-bud, its ovary inclosing another flower-bud.
6.	Of usual structure.	4-cleft.	4, petaloid.	1 flower-bud, perianth single.
7.	Of usual structure.	5-cleft.	5, petaloid.	8 flower-buds.
8.	Of usual structure.	5-cleft.	5, petaloid.	4 ovaries and 2 flower-buds.
9.	Of usual structure.	4-cleft.	4, petaloid.	6 flower-buds.
10.	Of usual structure.	5-cleft.	None.	3 ovaries, 2 flower-buds.

* Read before the Botanical Society of Edinburgh, April 10, 1845.

In the first example mentioned in the Table the stamens were converted into petals, the central fasciculus of vessels in each bifurcating upwards, each branch losing itself in a small crested process. The buds occupying the centre of the flower are worthy of being described in detail.

No. 1. Calyx 4-cleft, very irregular, coloured blue; corolla 4-cleft; stamens 3, their connectives prolonged each into a small petaloid process; ovary cleft half way and inclosing another which was trifid at the apex, one of the pieces producing perfect pollen, in its interior six rows of ovules.

No. 2. Calyx very irregular; corolla 6-cleft; stamens 5, alternating with the divisions of the corolla; the place of the sixth stamen occupied by an ovary, open half way at the outer side, 5-cleft at the apex, and bearing ten rows of ovules.

No. 3. Calyx 4-cleft, irregular; corolla 4-cleft, regular; stamens four, petaloid; instead of an ovary a corolla 4-cleft, having five stamens and a small ovary bearing ovules.

No. 4. Calyx 4-cleft, very irregular and petaloid; corolla 4-cleft, with four alternating stamens, some wholly, others partially converted into petals; in place of an ovary a flower-bud with 4-cleft calyx, corolla 3-cleft, stamens four, and ovary of the usual structure.

No. 5. All the parts petaloid.

No. 6. Calyx very irregular, 6-cleft; corolla 2-cleft, with three imperfect stamens; ovary 3-cleft at apex, open half way down; ovules natural.

No. 7. Same as the preceding.

In flower No. 2. of the Table there were between the calyx and corolla numerous bodies, some green, others blue, of various forms mixed up with ovaries, bearing perfect ovules. The flower-buds and separate ovaries, occupying the place of the natural ovary, were pedunculated; the ovules were mostly imperfect, being composed each of a single tough cellular membrane, the cells with abundance of starch globules; others were converted each into a mass of lobed green cellular tissue. In one instance a flat spatulate leaf had its edges occupied by numerous ovules.

In flower No. 5. (see Table) the place of the pistil was occupied by a flower-bud, its *calyx* of two large lobes (opposite the two large divisions of the outer calyx), *corolla* of two divisions alternate with those of the calyx, one petaloid *stamen*, *ovary* partially petaloid, of two divisions alternate with those of the corolla, on its walls numerous ovules; it inclosed also a corolla of two divisions, with two stamens and a perfect ovary.

In flower No. 8. of the Table the centre was occupied by four ovaries and two flower-buds closely embracing another ovary. These four ovaries were nearly of the usual form, each supported

on a peduncle; the smallest contained no ovules, another had only a few; one of the larger was open at the apex, which consisted of four petaloid processes; the other was bifid at the apex, one of the divisions leafy, the other of the usual structure; it contained numerous ovules; these were confined to its lower half. One of the flower-buds alluded to had its *calyx* 4-cleft of the usual structure; *corolla* 5-cleft; *stamens* five, some perfect, others petaloid; in its centre a solitary petal with one stamen and one ovary, these two confluent; on the walls of the ovary were numerous normal ovules mixed with others converted into leaf-like bodies, and some presenting the form of two green leaflets with an ovule in their axil (fig. 1). The ovary already mentioned as being embraced by the two flower-buds was half an inch in length, cleft half way on one side, all the way on the other (fig. 2); on its edges were

Fig. 1.

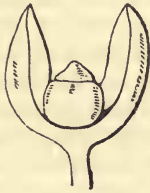


Fig. 2.



numerous ovules; in its interior and continuous with the axis there was present a corolla of two lobes, with one stamen and a pedunculated ovary, containing a few ovules. The buds occupying the centre of the flower in No. 9. of the Table are worthy of detailed description.

No. 1. *Calyx* none; *corolla* of ten petals; *stamens* ten, alternate with the petals; the place of the ovary was occupied by two flower-buds, each with single perianth, imperfect stamens, and one ovary in each.

No. 2. *Sepals* five; *petals* eight; *stamens* ten, in two whorls; *ovaries* two, almost natural.

No. 3. *Sepals* three; *petals* three; *stamens* three, alternate with the petals; *ovary* of three carpellary leaves with six rows of ovules.

No. 4. *Sepals* five, an ovary adhering to the outside of one; *petals* five; *stamens* five, alternate with the petals; *ovary* of five carpellary leaves with ten rows of ovules.

No. 5. *Sepals* three; *corollæ* two, each of three petals; *stamens* three; *ovary* single.

No. 6. The central flower: *calyx* none; *corolla* 5-cleft; *stamens* five, petaloid; *ovary* of three carpellary leaves, *ovules* in six rows.

In flower No. 10. (see Table) the centre was occupied by three ovaries and two small flower-buds. One of the ovaries was much compressed, of two carpellary leaves open half way, its ovules perfect; another of the same size and structure inclosed one like itself, the ovules imperfect; the other larger than any of the two former, of five carpellary leaves inclosing ripe seeds, beside it a small flower-bud with all the parts converted into leaves; the other flower-bud had calyx, corolla and stamens nearly regular, its ovary of two carpellary leaves, cleft half way; in the upper part of it were ripe seeds; it inclosed a flower with 3-cleft calyx, corolla of one petal, two stamens alternating with it, its ovary and ovules quite natural. In some instances the place of the ovary was occupied by a number of small green leaves. In some the calyx and corolla had the same colour and structure; in one instance imperfect flower-buds and separate carpels were developed in the axils of the sepals; the stamens in some were partially, in others wholly petaloid; the conversion of the ovary into a leaf and of the ovules into buds was evident in several cases. Many of the deviations from the usual structure here described have been already recorded by different observers and require no comment.

I would, however, particularly allude to the changes which the ovarium and ovules present, and the inferences which may be drawn from these.

A simple ovarium is considered to be a modified leaf folded upon itself, the margins united, and these alone in most cases constituting the placenta (necessarily double) and producing ovules. It was at the same time supposed that the stigma was a mere prolongation of the midrib of the carpellary leaf, and therefore single and terminal. The "greatest botanist of this or any age" has satisfactorily demonstrated (*Annals of Nat. Hist.* vol. xi. p. 35) that each simple pistillum or carpel has necessarily two stigmata, which are to be regarded, not as terminal, but lateral; the style where present being only a mere attenuation, in many cases very gradual, of the whole body of the ovarium. Most *Gramineæ*, many *Euphorbiaceæ*, several *Irideæ*, &c. are stated as illustrating this point. The ovaria, in some of the monstrous flowers already described, appeared to afford proof of the same; and many carpels in the earlier stages of their development yield ample evidence that the opinion alluded to is in strict accordance with nature.

Ovules have been compared to buds formed upon the margins of some true leaves, and declared to be analogous to them in

structure. Professor Henslow has recorded instances in the mignonette of the ovules being transformed into leaves, either solitary or rolled round an axis, of which the nucleus is the termination. Others have maintained that in certain families the ovules are parts of the carpellary leaves themselves. In confirmation of this, M. Ad. Brongniart has published an account of a monstrosity of *Delphinium elatum*. On the borders of the carpels were observed all states of transition from lateral trifid lobes of the leaf to true ovules. The lateral teeth of these lobules became atrophied; the middle part was hollowed and curved upwards and inwards in the form of a hood, so as to constitute the primine. The nucleus was described as originating from a cellular excrescence or papilla situated on the upper surface, upon the median nerve of each lobe a little below its summit. M. Brongniart considers it a new production, a cellular papilla, developed on the superior face of the middle lobe of the leaflet, and in the cavity which the latter had formed. Some of the ovules observed in the gentian appeared at first to confirm this opinion. In examining its merits, however, it appears necessary to take into account two circumstances, the order of development of the ovules, and that of their individual parts. From careful examinations made some years ago, I have been convinced that in some carpels whose ovules are numerous, the order of development is from the base to the apex. In very early stages of the carpel, the ovules are confined to the lower part alone, there being no trace of them toward the upper portion of the placenta. At a more advanced stage they occur through the greater part of its extent, but still there is a very evident difference (previous to impregnation) between the progress made by ovules from the base of a placenta, and those nearer to its apex; this is obvious to the unassisted eye in regard to the development of the membranes, but actual measurement removes all doubt. The *Viola canina* may be mentioned as an example within the reach of those who choose to investigate this matter. In regard to the second point, viz. the order of development of the individual parts (reference is here made to the three outer membranes only), it is unnecessary to say much. In the young capsules of the violet already alluded to, it will be found that each ovule first appears toward the lower part of the placenta as a cellular papilla, the nucleus; the secundine soon makes its appearance as a cellular ring around the base of the former; and lastly, another ring, the rudiment of the primine, appears on the outside of the secundine; the outer membrane, however, becomes rapidly developed, inclosing and concealing the other two. It may be also worthy of notice, that the ovules make their appearance while the carpel is still entirely cellular, there being no trace of any vascular tissue till a more

advanced period. The nucleus therefore is not an organ necessarily dependent (at least in its earlier stages) on the membranes which surround it, nor developed subsequently to them, as would seem to be implied in the account given of M. Brongniart's opinion, translated from the 'Comptes Rendus' (March 1844), and published in a late Number of the 'Annals and Magazine of Natural History.'

LVI.—Notes on the Synonymy of the Genus *Apion*, with Descriptions of Six new Species, &c. By JOHN WALTON, Esq., F.L.S.

[Continued from p. 342.]

57. *A. difforme*, Germ., Curt., Steph., Schönh.
— *compressicorne*, Dej. Cat.

THE anomalous structure of the antennæ and the parts of the legs, which eminently distinguishes the male of this species, is entirely sexual. The female differs in having the rostrum slender and longer; the antennæ simple, inserted behind the middle of the rostrum, entirely black; the legs slender; the basal joint of the anterior tarsi short and not produced at the apex, the posterior tibiæ and tarsi much less dilated at their apices; all the trochanters, the tibiæ and tarsi of a deep black; the epigastrium simple. The male was originally described by Germar from a specimen sent to him by the late Mr. Haworth; subsequently Mr. Curtis figured and also described the male; I succeeded in capturing a great number of both sexes in October 1837, which gave me an opportunity to identify distinctly the female. The female has frequently been mistaken for *Ap. Trifolii* of Linnæus (*Ap. æstivum* of Germar), but it is instantly distinguished from that species by having, independently of other characters, the anterior coxæ and trochanters always densely black.

This curious species was formerly considered to be very rare, yet of late years it has been found in abundance in many localities in the south of England, but not in the north to my knowledge; I found a great number of both sexes near Mickleham in Surrey the 1st of October 1837, and again at Hastings in September on the *Polygonum Hydropiper* abundantly. "Common near Brighton, Arundel, Birch Wood, and other places in the autumn," Mr. S. Stevens.

58. *A. dissimile*, Germ., Schönh.

Black and shining. Head very broad, the frons posteriorly flat, rugose or rugose-punctate, between the eyes more or less deeply excavated, the excavation with one or more irregular curved ridge or ridges; eyes very prominent; rostrum moderately long,